How To Apply AIRS QA

This document summarizes how to apply QA information when working with AIRS Level-1B IR radiances product (AIRIBRAD) and Level-2 standard retrieval product (AIRX2RET).

5/2008

AIRIBRAD

Relevant QA Documentation:

- Level-1B QA Quick Start
- Selected AIRS QA Fields

AIRS science team recommends users choosing L1B radiances for their research use the calibration properties files rather than the channel properties files. Calibration properties files include a documenting header describing their contents. By reading these files, users can assess AIRS channel qualities spectrally, radiometrically and spatially.

The calibration properties files provide the quality indicators on a per-channel basis. Key indicators are:

- Frequency centroids and FWHM width.
- NEdT at 250 K and 300 K.
- Spatial centroids.
- AB-weight.
- Spectral Quality *Spec_qual.*
- Number of samples >= 3 sigma *n3sigma.*
- Number of pops observed *npops*.

We recommend that users filter channels by requiring that Spec_qual = 1 (or both 1 and 2) and npops <= 1 and NEdt250 <= 1 K. Users may work out an effective NEdT for any scene temperature from the values quoted at 250 K and 300 K. They may also choose to further filter channels by thresholding on n3sigma.

Additional per-scan-per channel and per-FOV-per channel QA procedures are spelled out in the *Level-1B QA Quick Start* guide. Finally, more advanced quality checks can take sun glint into account, by reading glint location or sun_glint_distance stored in the product files on per scan line basis.

AIRX2RET

Relevant QA Documentation:

- Level-2 QA and Error Estimation

This document details QA usage by parameter groups, temperature profiles, surface properties, minor gases and OLR. Prior to Version 5, RetQAFlag is the main QA indicator. Beginning Version 5, users are strongly encouraged to use Qual_* instead.

In general,

- When satisfactory infrared cloud cleared radiances cannot be produced, all surface and atmospheric retrieval products are flagged quality = 2 (do not use).

- If clouds can be obtained from the startup state, the cloud related products including outgoing longwave radiation (OLR) and precipitation estimate are flagged quality = 1.

- Whenever the IR/MW retrieval is completed, clouds are computed from that state and flagged quality = 0. The surface and atmospheric retrieval products are then flagged accordingly based on predefined criteria.

For temperature profiles, results above pressure altitude *PBest* is considered of the best quality (quality=0), between *PBest* and *PGood* is of good quality (quality=1), antying below *PGood* is considered bad, not to be used. The level of quality is determined by comparing error estimates with a set of predefined thresholds and is described in the Level-2 QA document.

Qual_H2O (is a 2-D full swath field) is the overall quality flag for the water vapor fields, including the water vapor profiles.